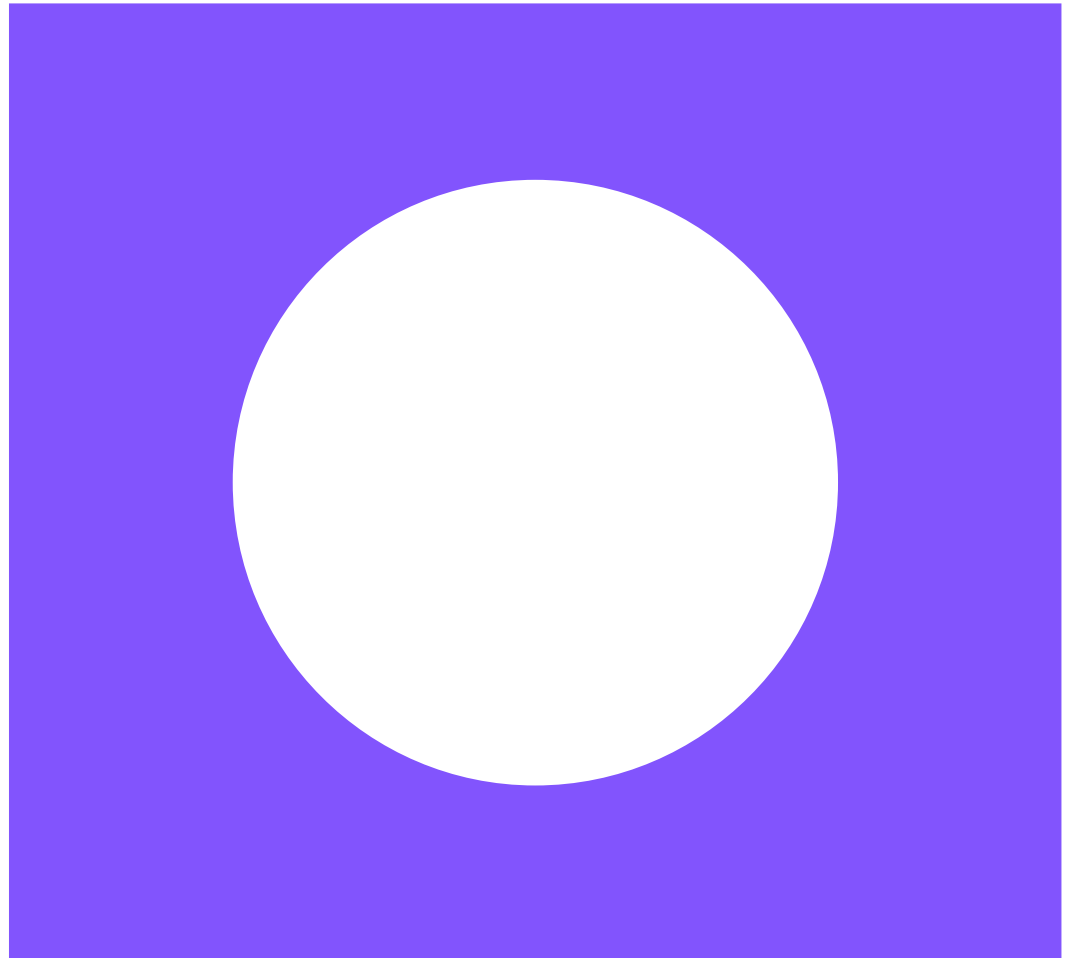




A494 River Dee Bridge Replacement Scheme

Construction, Buildability and Phasing Report

August 2025

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August 2025

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1 Introduction

1.1 Purpose

This report outlines the proposed construction methodology and phasing for the Preferred Option of the A494 River Dee Bridge Replacement Scheme (the “Scheme”). It has been developed to demonstrate the constructability of the preliminary design proposals and to provide a basis for the Environmental Impact Assessment. The construction methods described are indicative and not prescriptive; the final methodology will be determined by the appointed contractor. The contractor will be responsible for evaluating the impacts of their chosen construction methods and for obtaining any necessary consents.

Significant constraints, areas of interest and advanced/early or prior construction works are also noted. It identifies key aspects of the construction phase and describes how proposals are being developed to minimise impacts, in so far as reasonably practicable, to local communities. It further describes the anticipated programme and key activities that will be undertaken on site in relation to the Scheme.

The A494 River Dee Bridge Replacement Scheme is currently in the KS3 Preliminary Design phase. As the Scheme progresses through Welsh Governments Key Stage process the detailed design, construction proposals, programme and Scheme costs will be further developed.

1.2 Abbreviations

Table 1.1: Abbreviations

Abbreviation	Definition
WG	Welsh Government
NR	Network Rail
TTM	Temporary Traffic Management
EB	Eastbound
WB	Westbound
c/w	Carriageway
CR	Central Reserve
NMU	Non-motorised Users
Ch	Mainline chainage expressed in metres
KS	Key Stage
TW	Temporary Works
SU	Statutory Undertakers
CEMP	Construction Environmental Management Plan
RAMS	Risk Assessments and Method Statements
PLI	Public Local Inquiry
SU	Statutory Undertakers

2 Outline Description of the Scheme

2.1 Introduction

The North & Mid Wales Trunk Road Agent (NMWTRA) has appointed Mott MacDonald Ltd as the lead consultant to provide multi-disciplinary consultancy services for the A494 River Dee Bridge Replacement Scheme ("the Scheme"), covering Welsh Government's Key Stage Approval Stages 3 and 4.

Key Stage 3 involves development of the WelTAG business case, preliminary scheme design, Environmental Impact Assessment, and preparation of draft Orders documentation.

Key Stage 4 covers completion of statutory processes, including publication of the draft Orders, public exhibitions, managing objections and representations, and preparation for and participation in a Public Inquiry (if required).

2.2 Scheme Overview

The Scheme consists of the following key features, refer to Appendix B for the Scheme General Arrangement drawing:

- The proposed scheme comprises a 1.0km long off line re-alignment (to the south of the existing carriageway) to allow the construction of two lanes and a hard shoulder in each direction with an NMU route running alongside the westbound carriageway
- A new river crossing to the south of the existing A494 river crossing
- Along the Westbound carriageway an improved active travel facility
- A re-configured access from the A494 westbound carriageway to the traveller site and pump station area
- Demolition of the existing bridge structure

2.3 Main Construction Activities

Extensive utility diversions and protection works are likely to be required as part of the Scheme including sewage pumping rising mains, high voltage electricity cables, gas supply mains and telecommunications. Details of the utility diversions and protection works required are included in the Utilities Impact Report (report ref: 395318-MMD-00-XX-RP-C-0012).

Diversion of the Queensferry Drain (a Natural Resources Wales main river), which is situated on the southeast side of the A494 and currently flows in a culvert beneath it, west of the North Wales Coast Railway Line and in open channel east of the railway line. New sections of open channel would be provided either side of the railway with a section of existing culvert beneath the railway line being retained. A new river pumping station and drainage outfall to the River Dee would also be required as part of the diversion work.

Temporary traffic management would be required on both the trunk roads and local road network in order to safely construct the works, although it is anticipated that traffic management on the local road will be for limited and short durations of time. Further details are given in Section 8.

Earthworks would be required to construct the embankments required for the designed highway alignment, as well as for drainage, structures and landscaping works.

Drainage systems would be constructed to accommodate highway drainage and run off from adjacent land. This drainage would, where practicable, be used to manage temporary flows during construction, subject to obtaining the necessary discharge consents.

A number of new structures would be constructed, including a bridge crossing the River Dee. In addition, there would be new culverts to construct and existing culverts to demolish.

As earthworks, drainage and structures elements are completed, construction of the new and improved sections of highway would be carried out. This would include the carriageway construction, traffic signs, road markings, VRS and street lighting.

Once the new river bridge is completed, the existing structure will be demolished, with the exception of the in-river support piers, which are anticipated to remain in situ.

2.4 Land Take

Along the main Scheme corridor, where possible, working space from the edge of the earthworks to the highway boundary has been allowed for. For construction working space beyond the final boundary fence line, essential licences have been allowed for in places and allowances for permanent easements for future maintenance. Owing to the constrained nature of the site, three site compound / lay-down areas have been allowed for as essential licences with the land being returned to the current landowners on completion of the scheme. The extent of the land take proposed and will be acquired for the permanent and temporary works is illustrated on drawing 395318-MMD-00-XX-DR-C-0007, included in Appendix B

The land take required for the construction of the new decks for the River Dee crossing has assumed that these will be assembled onsite. Bridge beams will be transported by road direct to the site, they will arrive in prefabricated sections of about 20-25m and where final assembly will be required.

2.5 In River Working Restrictions

In developing the Scheme, the project team has engaged with Natural Resources Wales (NRW) to identified key environmental considerations for in-river works. Three primary factors were highlighted:

- Activities that generate noise and vibration
- Disturbance and mobilisation of silt
- Night-time operation that may affect migrating fish

In response, the project team provided detailed information to support NRW's assessment of potential risks to migrating fish species, including:

- Proposed working hours for the piling activities (8.00am to 5.00pm)
- Number of piles to be installed per day
- The size of the piles
- Pile casing installation method
- Duration of the full piling programme
- Non-piling time during the installation period
- Confirmed that de-silting will not be required

Following this consultation, NRW confirmed that potential impacts on the river environment had been mitigated as far as reasonably practicable. Consequently, NRW lifted a previous constraint that restricted in-river works to the period between September and February. This decision was based on NRW's understanding that:

- Percussion piling will not be used

- The working method aligns with the described approach
- Time limits for piling activities will be adhered to

Further details are provided in the Environmental Statement (Ref: 395318-RML-00-XX-RP-L-0002).

3 Construction Programme

3.1 Programme Overview

As part of the constructability considerations, an outline preliminary construction programme has been developed and is included in Appendix C of this report. The programme is based on an initial contract award in March 2026 to commence detailed design, followed by the award of the construction stage contract in August 2027.

It has been assumed that the construction will be carried out in three main stages:

- Advance works and mobilisation
- Construction of the new river bridge and approaches
- Demolition of the existing bridge, completion of finishing works and demobilisation

The programme and associated activities may be subject to change during both the detailed design and construction phases. The timings provided are indicative and reflect the current best estimates. Section 4 describes the provisional overall construction programme and the planned sequence of operations.

The main construction works are estimated to span approximately 32 months, commencing in August 2027 and concluding in April 2029. Section 1 will cover the construction of the new bridge and associated infrastructure. Section 2 will involve the demolition of the existing bridge and works to the approaches.

Upon substantial completion of Section 1, the majority of works are expected to be sufficiently advanced to allow the road to open to traffic. The demolition of the existing River Dee bridge will follow thereafter.

4 Overall Phasing

4.1 Work Phases

The Scheme has been divided into three main stages:

1. Mobilisation including detailed design
2. New river bridge and approaches
3. Demolition of existing bridge, finishing works and demobilisation

4.2 Definitions

Some activity descriptions below include construction terminology that may be unfamiliar to some readers. To support understanding, an explanation of some key terms is included below.

'On-line' and 'off-line' works: 'On-line' works refer to construction activities carried out within the footprint of the existing highway e.g. an existing section of road that needs to be dug out and remodelled. 'Off-line' means works that take place outside of the existing highway boundary, typically on adjacent land. The distinction is important, because it has a major influence on the construction phasing. For example, traffic will normally require diverting from the existing roads – the 'on-line' areas – in order to carry out the works. This in turn may require the provision of an alternative route, which could be onto an area of completed 'off-line' work.

'Bulk earthworks': This is the excavation, movement and placement of the majority of (the 'bulk' of) construction 'fill' materials using heavy earth-moving equipment such as large tracked excavators, articulated dump trucks and dozers. Earthworks materials could be existing 'natural' ground, including soil and underlying layers, 'made ground' i.e. pre-existing man-made earthworks features such as embankments, or imported fill materials such as quarried aggregates.

'Earthworks season': This is the period between spring and autumn that typically would be expected to be sufficiently dry, and with ground and air temperatures which are sufficiently warm to aid drying, that earthworks materials can be handled without excessive handling and treatment

4.3 Temporary Diversions and Phasing

Throughout the construction period, all the existing highway routes would remain open and access would be maintained to all properties along the route. There will be a need to divert some NMU routes during construction as it is not safe for these to pass through the new bridge construction site.

Two lanes of traffic in each direction will be maintained along the A494 throughout the duration of the works during peak times, night-time lane closures will be required for verge and tie in works and full closures to facilitate removal of the sign gantry to the east of the River Dee.

A suitable speed limit would be imposed on all sections of public road passing through a work site to ensure the safety of the road users and workforce.

4.4 Mobilisation

Mobilisation would commence once a contractor has been appointed and the detailed design and necessary approval are in place for these works. The extent of mobilisation works will be determined by the contractor, however, it is expected to include the following:

- Possession of the land and demolition of the remaining structures to the south of the A494 between the railway bridge and Queensferry Interchange to provide a material storage area during the next stage.
- Construction of the revised local highway arrangement to access the traveller site and main compound area, this will include all necessary utility diversions, drainage, kerbing and pavement.
- Construct the new pumping station and associated outfall for the Queensferry Drain, divert the river through the new infrastructure (this will be phased with the utility diversions).
- Implement temporary walking and cycling route diversions, it will be necessary to provide temporary routes whilst the permanent routes are implemented from the traveller site to the Queensferry Interchange .
- Establish main office and stores compound within the existing hard standing area to the west of the traveller site.
- Install a new temporary access from the A494 to the east of the river Dee to gain access to the satellite stores, office and welfare facility.
- Commence works on the eastern crane platform and temporary jetty to facilitate mobilisation of the Jack-up barge and service the in river operations.
- Environmental mitigation works.
- Diversion of rising main sewers, either fully or temporarily at points of conflict with the proposed bridge abutments.
- Diversion of 33kV overhead electricity cables located to the east of the river.

4.5 New River Bridge and Approaches

This stage will focus on the construction of the diverted carriageway and new bridge crossing, which in the main is off-line as shown in Figure 4.1 below.

In river works for the new River Dee Crossing would need to be undertaken during the day to avoid impact on migrating fish. The 'in river' works are limited to installation of the pile casings, piles and pile caps. The new bridge piers within the river are expected to be constructed using barges that are able to jack up from the river bed to provide a stable platform. This would enable the piles and concrete piers to be constructed from it. Materials would be brought to the platform on barges that have been loaded at the temporary jetty facility. The detail of this operation is described in Appendix D. Approximately 100m upstream of the new bridge and 16m downstream of the existing bridge has been allowed for working space within the channel.

Appendix D discussed a possible temporary jetty that may be needed to service the jack-up barge from the river bank. The project team did consider the use of the Airbus pier facility upstream of the bridge to assemble the jack-up barge and service the river works operation. This was ruled out due to the heavy silting that has occurred since the facility was taken out of use and the expected restrictions that would be put in place by NRW to de-silt the area and bring the facility back into use. The risks and costs associated with this operation were deemed too high and the temporary jetty at the bridge site was considered to be a more feasible option.

The new bridge abutments would be accessed from the east and west river banks to allow piles to be installed and a reinforced concrete abutment constructed and material placed behind them to form the join with the adjacent embankments

In order to complete the approach embankments it would be necessary to clear the remaining site of vegetation and top soil and existing features such as street furniture, fencing and signs.

Prior construction the new bridge abutments and placing embankment fill it would be necessary to divert the section of open and culverted watercourse and also divert and / protect existing utility apparatus that has not been moved during the advanced works stage.

Embankment material would be delivered to site via the A494 where it would be spread in layers and compacted up to the underside of the road pavement where it would be capped off to provide the pavement foundation.

Drainage channels, catchpits and outfalls would be installed within the new verge and the highway pavement would be laid up to its final level and across the new bridge structure.

The two lanes of westbound traffic would be diverted onto the new carriageway, nighttime lane closures would be needed to construct the tie-ins including surfacing, white lining, safety barrier and signage.

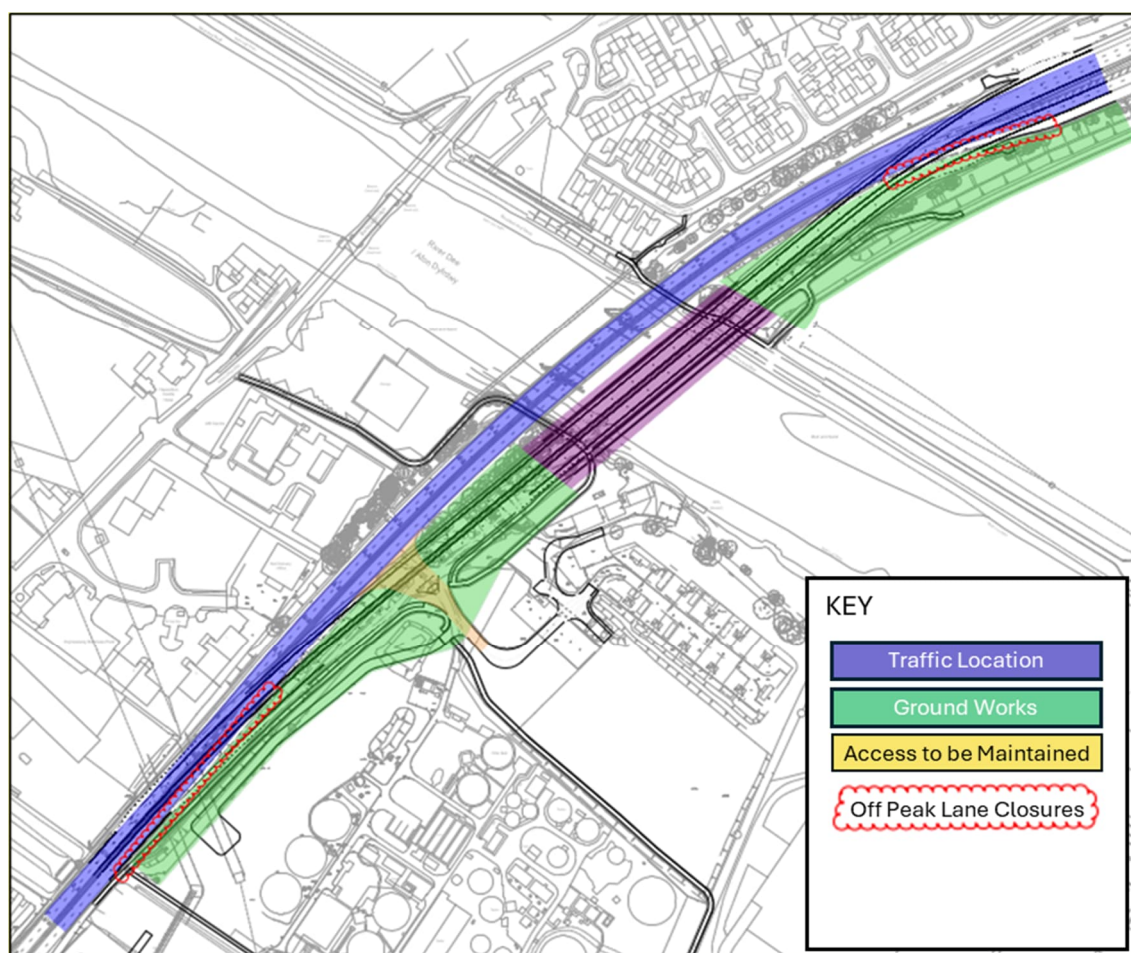


Figure 4.1: Approach embankments and new River Dee crossing

4.6 Bridge Structure

The construction of the in-river piers would be from a jack-up barge. Materials required for the construction of the river piers would be taken to the work area directly on a service barge from the temporary jetty located on the eastern bank with concrete pumped from the closest river bank. Further details of the assumed in-river works are provided within Appendix D.

Personnel access to the piers could be via a temporary scaffold walkway attached to the bottom flange of the existing bridge with a lightweight lattice bridge structure across to each pier.

Following installation of the casings the piles would be excavated and concreted. Precast permanent pile cap formwork may be attached to each pile allowing the reinforcement to be fixed and the pile cap poured for each pile.

Bearing plinths would be formed on top of the pile caps and bearings installed prior to lifting the steel superstructure into place.

The bridge beam installation can be carried out several different ways depending on the contractor's preference but typically would be expected to follow a similar sequencing to the below:

- Side span beams would be brought to site in small sections and assembled into larger sections adjacent to the crane lifting area. The beams would be installed in pairs spanning from the abutments and oversailing beyond the pier. The beams would be lifted into position from each respective abutment using a large capacity crane.
- The central span bridge beam sections would be transported to the site and lifted into place from the east abutment using a large capacity crane.
- Permanent formwork would be placed between the installed bridge beams, followed by reinforcement and concrete deck incorporating precast edge beams. The materials required to construct the bridge deck would be installed using smaller cranes positioned at the abutments.
- Waterproofing, surfacing, lighting and barriers would be installed thereafter- substantially completing the new River Dee Bridge.

Diversion of the eastbound traffic onto the new structure allows the works between the old and new carriageway to be completed as shown in Figure 4.2. It is likely that a full nighttime closure of the eastbound carriageway would be required in order to safely complete the surfacing, white lining and safety barrier.

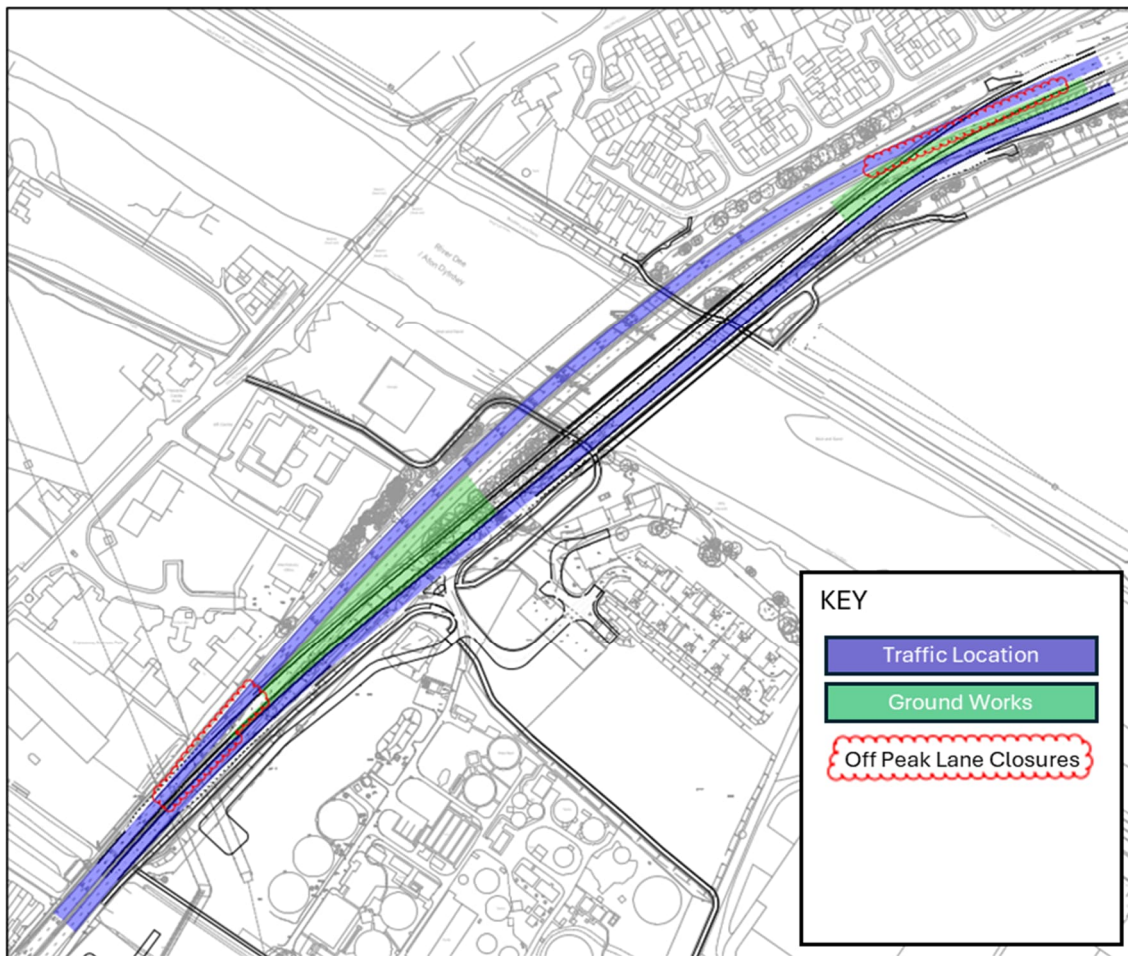


Figure 4.2: Completion of approach embankments

4.7 Demolition of the Existing Bridge and Finishing Works

The eastbound traffic would be diverted onto the new carriageway as shown in Figure 4.3 below.

The existing bridge would be demolished as detailed within Appendix D.

The storage area between the railway bridge and Queensferry Interchange would no longer be required. This would be removed and the watercourse and new walking and cycling route would be completed along with all landscaping.

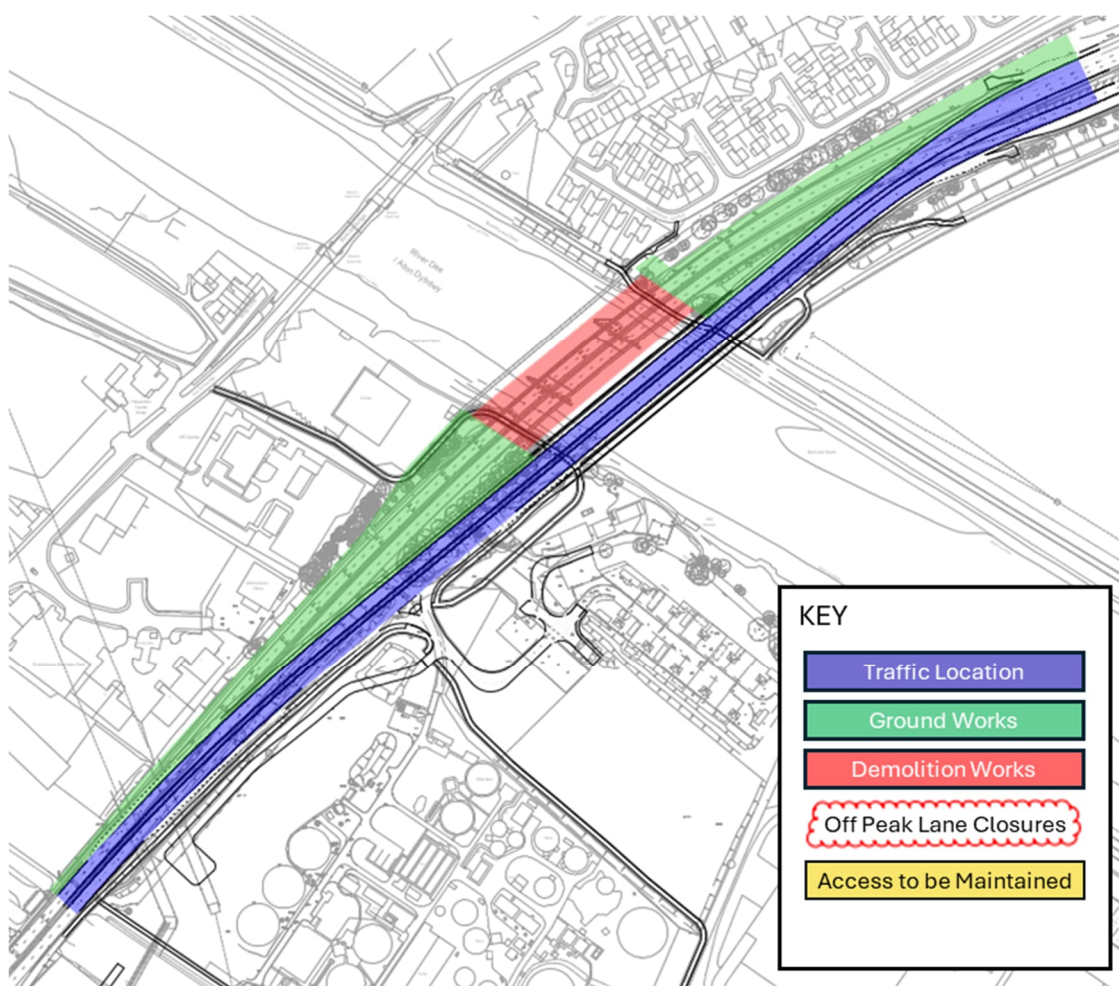


Figure 4.3: Demolition of Existing bridge and finishing works

4.8 Environmental constraints to the scheme

The timing of works will be constrained by the fish migration seasons, the periods for demolition of known bat roosts and the need to avoid the bird nesting season. A number of pre-construction or pre-clearance checks for badgers, water voles and otters, together with staged vegetation clearance procedures to allow mobile species to escape, are set out in the Register of Environmental Actions and Commitments which forms part of the CEMP. Adequate time must be allocated to ensure these activities are completed in accordance with environmental obligations.

Works in the River Dee, particularly the construction of foundations for the bridge, should minimise the impact on the main migration seasons for Lamprey, Salmon and Sea Trout. All works in and over tidal waters including the River Dee below MHWS would require a Marine Licence from NRW.

A bat roost was identified in 3 Chester Road East and so demolition of this building would be limited to the period April – October and in accordance with a Protected Species Licence. As this building is also likely to be used by small birds such as sparrows, the bird nesting season will restrict demolition to September – October unless bird deterrent measures can effectively be implemented. A number of trees within the Welsh Water Treatment Works (WWTW) alongside the proposed access from Factory Road have been shown to have potential as bat roosts. If

activity surveys during KS4 confirm roosting bats then a licence would be obtained before these trees are removed.

Clearance of, or works to, any vegetation or structures must be timed to avoid nesting birds unless an ecologist can rule out the presence of nesting birds by inspection. In practice, works which could affect nesting birds would be programmed for September to early March, inclusive to avoid this risk where possible.

Although the Scheme does not affect many areas with natural soils, the stripping and handling of soils for re-use in landscape or habitat restoration, and the stripping of temporary compounds in land used for agriculture, would be expected to be programmed to avoid extended wet weather which would make soils prone to loss of structure.

The works near the Queensferry Drain outfall would affect heritage assets such as the Aston Quay. The need for investigation and recording is being established. If required, such investigation would be programmed in advance of works at this location.

5 Disruption Due to Construction

5.1 Construction Working Hours

The majority of construction works would normally take place between 07:00 - 19:00 Monday to Friday and 07:00 to 13:00 on Saturday with a restriction on the Installation and removal of pile casings within the river undertaken between 0800 – 1700hrs Monday to Saturday. There may be exceptions to these hours for oversize deliveries and junction tie-ins etc. or for traffic management reasons.

Due to traffic management restrictions, safety and operational constraints, some operations would need to be carried out at night. The relevant Local Authorities would be liaised with where notable operations are to be carried out at night, such as erecting bridge beams. Liaison would also be carried out with the local community, businesses and other key stakeholders.

Where construction works could have a significant impact on neighbouring properties, businesses and residents, the affected parties would be advised of these works prior to their occurrence. Environmental Health Officers (EHOs) from the Local Authorities would be consulted with regard the nature and extent of any such works. In addition, the project team would liaise closely with members of the public, businesses and EHO to minimise the disruption and impacts resulting from the construction works.

5.2 Construction Strategy to Minimise Disruption

Construction of the Scheme would cause a degree of disruption to the local environment, local people and to users of the local highway network. Such disruption is unavoidable and measures would need to be implemented to minimise the adverse effects. The most significant effects are likely to be temporary land take, visual intrusion, increased noise and vibration and reduced air quality associated with the works on site. In addition, there would be disruption to road users and NMUs.

The strategic aim is to eliminate the sources of disruption and implement measures to minimise any unavoidable disruption where reasonably practicable. Prior to construction the detail of these measures would be further developed, and where appropriate would be location specific. As the detailed design, construction programme and philosophy are developed so too would be the measures to minimise disruption.

Mitigation measures would be recorded in the Site Environmental Control Plans that form part of the CEMP. Task specific mitigation measures would also be included in RAMS to be developed before related works commence.

5.3 Construction Working Areas and Haul Routes

Where there is sufficient working space within the permanent land take for the Scheme, then construction can be carried out without additional temporary land.

However, in some locations because of constraints on permanent land take or due to the method of construction required, additional areas of land are needed temporarily to allow construction. This can be space for:

- plant operation and/or access e.g. haul routes for earthworks
- temporary works installations e.g. pumps / ponds for temporary drainage
- on-site assembly e.g. steel reinforcement cages or structural steelwork

- working space for statutory undertakers' utility diversions.

5.4 Waste Minimisation and Management

The CEMP would outline the way in which waste would be minimised and managed throughout the construction of the works. This would include waste generated through works activities and also waste generated by the associated office and welfare facilities.

A Site Waste Management Plan (SWMP) forms part of the CEMP and would be developed by the Contractor for the Scheme to ensure that all waste is handled efficiently and managed appropriately.

5.5 Noise and Vibration from Construction Activities

Where appropriate and practical, noise and vibration from construction activities will be assessed in the Environmental Statement.

The Public Protection team of Flintshire County Council would be consulted on the noise and vibration limits to be included within the CEMP. It is anticipated that a scheme of noise and vibration monitoring at key receptors would be agreed with the Council to ensure compliance with the limits set.

It is anticipated that the appointed contractor will undertake pre-construction surveys of properties that may be impacted by potential vibration. In addition to property owners, the contractor should also liaise with DCWW regarding the potential risk of vibration impacting their settlement tanks within the water treatment works.

Where activities are anticipated that may generate a significant impact, such as bridge construction, construction methodologies will be developed to minimise this nuisance. Where specific activities remain where there are no reasonable alternative methods, detailed proposals would be discussed with the relevant Council officer and public liaison would be carried out.

BS 5228 (part 1 and 2) provides guidance on best practice to minimise noise and vibration impacts during construction. It also advises on proactive measures that can be taken in terms of liaising with residents. The following mitigation measures could be employed on site to ensure that noise and vibration levels are attenuated as far as possible and will be considered in preparing the CEMP:

- the use of 'best practicable means' during all construction activities, as contained in BS 5228
- switching off plant and equipment when it is not in use for longer periods of time
- establish agreement with the local authority on appropriate controls for undertaking significantly noisy works or vibration-causing operations close to receptors
- programming works so that the requirement for working outside normal working hours is minimised
- use of low noise emission plant where possible
- where feasible piling would be bored to protect sensitive sites
- the use of temporary noise screens around particularly noisy activities
- regular plant maintenance

6 Traffic Management Summary

6.1 Brief Description of the Works

Temporary Traffic Management (TTM) and restrictions would be needed to provide safe access and working areas for the construction workforce and their vehicles, plant and equipment, and to permit safe passage of vehicles and non-motorised users, such as pedestrians and cyclists, through and adjacent to the works.

These traffic restrictions must be carefully planned and managed and would include a variety of measures, from separating works areas from public access areas to full closures of certain roads for short durations and speed restrictions.

6.2 Strategic Aims for Traffic Management

The strategic aims of the TTM will be:

- To minimise disruption to road users during the works
- To minimise disruption to local communities and businesses and emergency services during the works, providing access throughout
- To provide a safe working area for the construction workforce
- To provide safe and clearly signed traffic routes through the works
- To ensure non-motorised users are provided with suitable facilities

6.3 Management of the Works to Deliver the Aims

Traffic management would comply with the requirements of Chapter 8 of the Traffic Signs Manual with scheme specific additions and relaxations as agreed with Welsh Government and NMWTRA and other relevant Highway Authorities. The speed limit on the A494 during construction will need to be reviewed and defined by the contractor as part of their construction methodology. This is to ensure appropriate risk mitigation for the workforce operating adjacent to the live carriageway and to manage safe access and egress to the East and West compounds. A Temporary Traffic Regulation Order (TTRO) may need to be applied for by the contractor.

The traffic management strategy will be set out in a Traffic Management Plan (TMP), which will be produced in consultation with the appropriate Highway Authorities and key stakeholders. The TMP will include details and plans that will outline measures such as:

- the minimum number of lanes that will be in operation during the works
- maximum temporary speed limits to be applied
- details of any carriageway closures and restrictions
- details of any slip road closures
- times of day that any restrictions would be in place
- the schedule for removing roadworks during bank holidays or provide the rationale for not doing so
- details of other identified traffic management in the vicinity of the scheme
- any significant events planned during construction works and measures that can be put in place to mitigate impacts on travel due to the roadworks
- details of breakdown and recovery arrangements during the works

- details on any measures to be put in place for driver compliance and enforcement of speed limits

6.4 Construction Traffic

Restrictions on the movement of construction traffic on the local road network would be agreed with the local Highway Authorities prior to commencing works. Access to the East and West compounds will be directly from the A494 to minimise the need to utilise local roads.

Direct access to the compound area located east of the river should be established from the A494 through the construction of a temporary access point. Manor Lane is considered unsuitable for site traffic owing to the lack of pedestrian infrastructure and its partial status as an unadopted private road.

6.5 Trunk Road Traffic Management

Minimising disruption to traffic on the trunk road would also reduce disruption on local roads as traffic is less likely to select alternative routes. Temporary traffic management measures would therefore be designed to keep trunk road traffic moving efficiently, for example by:

- Maintaining the existing number of operational lanes as far as is practicable
- Providing clear and consistent temporary signing and road markings
- Enforcing reduced speed limits where appropriate to reduce the risk of incidents (as well as for the safety of the workforce)
- Providing traffic monitoring and free breakdown recovery where appropriate

7 Temporary Land Take

7.1 Temporary Land Take

In order to carry out the construction works, it is essential that temporary land is acquired for the duration of the works for site compounds (including offices, stores, accommodation areas and car parking), construction working areas (including for temporary works and haul routes), topsoil and other construction storage areas and utility diversion working areas. The proposed land take for the scheme is detailed on drawing 395318-MMD-00-XX-DR-C-0007 in Appendix B.

7.2 Compound Assessment

The following selection criteria has been used:

- Utility supplies and facilities in close proximity; Telecoms, Power, Water and sewer, Power can be supplied by generator if power supplies very remote, a direct sewer connection is ideal, however a good outfall to surface water stream/ditch etc will suffice and a bio-digester [modern septic unit] can be installed
- Land not in any designated area
- Land not subject to constraints, planning or Environmental
- Land not prone to flooding Zone 3 (considering protection offered by existing flood defences)
- Land on good ground
- Minimising land of 'Best and Most Versatile' category (ALC Grade 1,2 or 3a)

7.3 Location of Site Compounds

Three parcels of land have been identified for use as temporary compounds as illustrated on drawing 395318-MMD-00-XX-DR-C-0007 in Appendix B.

7.4 Public Rights of Ways (PRoW) and Private Means of Access (PMA)

Existing PRoWs (e.g. footpaths and bridleways) and PMAs that would be affected by the Scheme would need to be suitably diverted during the works and reinstated upon completion.

8 Stakeholder Management

Early engagement and regular communication with stakeholders will be established and maintained throughout the construction phase. The Communications Plan will outline the engagement strategy and will need to be updated by the Contractor to agree the approach to delivery that actively manages interfaces and minimises disruption.

Minimising disruption – Arrangements will be developed in consultation with the highway authority, police, emergency services, and transport bodies to develop and agree traffic management plans, temporary diversion routes and speed limits during construction.

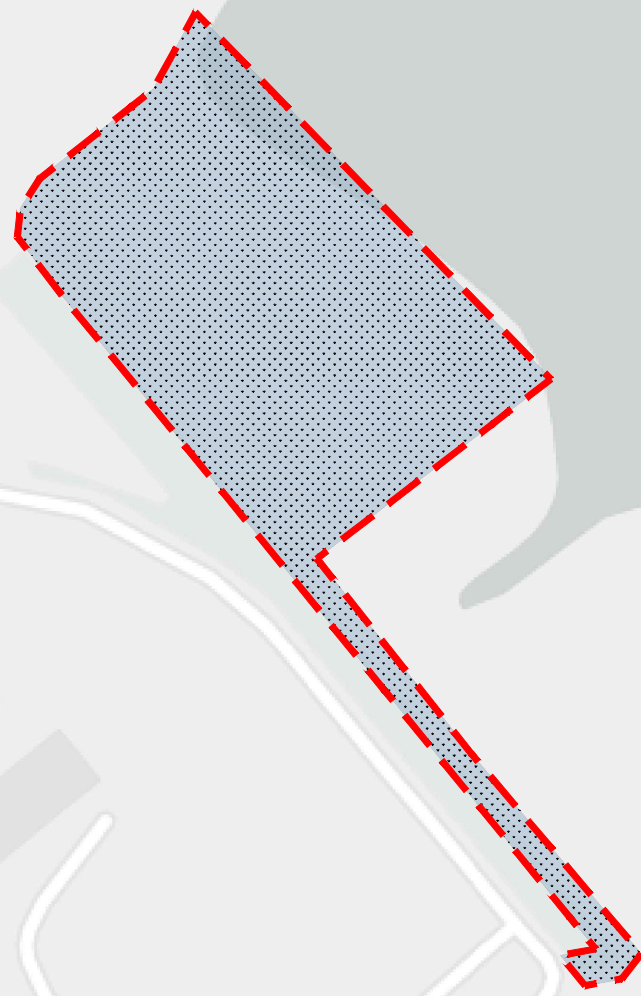
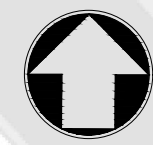
Maintaining access and facilities for landowners and occupiers, local businesses and residents – engagement with those directly affected at a personal level, engagement with the broader community through their representative bodies, coordination with utility companies for new services.

Communications events will be held regularly to inform local residents, businesses and key stakeholders of the planned construction activities in the period including traffic management phase changes, vehicle and material movements, special operational requirements including road closures, utility service outages for new connections and out-of-hours working for tie-in works.

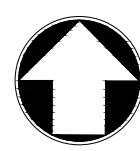
A. Scheme General Arrangement Drawing

B. Proposed Land Acquisition and Usage Drawing

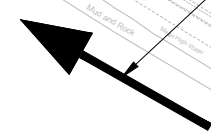
Inset A - Salt Marsh
What3Words: oval.tomato.digestion



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



14,000m to Inset A
from this point.



Site compound 3

Site compound 2

Site compound 1

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Survey AC0000808122

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C:\users\pro8318\appdata\local\projectwise\workdir\mott-gb-pw-03\dms27384\395318-MMD-00-XX-DR-C-0007.dwg Aug 12, 2025 - 1:33PM
PR08318

Notes

1. This drawing details the current Developed Design at Key Stage 3 of Welsh Government's Linear Stage Approval Process and is subject to further detail design development.
2. This drawing is to be read in colour.
3. This drawing is based upon the scheme layout as drawn on scheme General Arrangement drawing 395318-MMD-00-XX-DR-C-0002 Revision P05.
4. This drawing shows approximate land ownership extents based on information obtained from the Land Registry in August 2025. Mines and mineral rights / ownership not shown.
5. Land extents outside the scheme extents vary and where land information has been obtained from the Land Registry as part of the scheme search, this has been show to provide context.
6. This drawing presents the current status of land ownership (private, public and unknown), along with the projected extent and intended use of land to be acquired for the Scheme's construction. As land acquisition is subject to change, please refer to the most recent Compulsory Purchase Drawings for up-to-date information.
7. This drawing is to be read in conjunction with the Construction, Buildability and Phasing Report (395318-MMD-00-XX-RP-Z-0034) as well as all other related Mott MacDonald and RML drawings and specifications.
8. Unless otherwise stated all dimensions are in metres and all levels are in metres Above Ordnance Datum (AOD).
9. Information on this drawing is based on topographical data received from PM Surveys 2018 for the Queensferry site area, Survey Operations 2025 for Toyota Lindop site area, OpenStreetMap for Inset A and OS mapping data for all other areas.

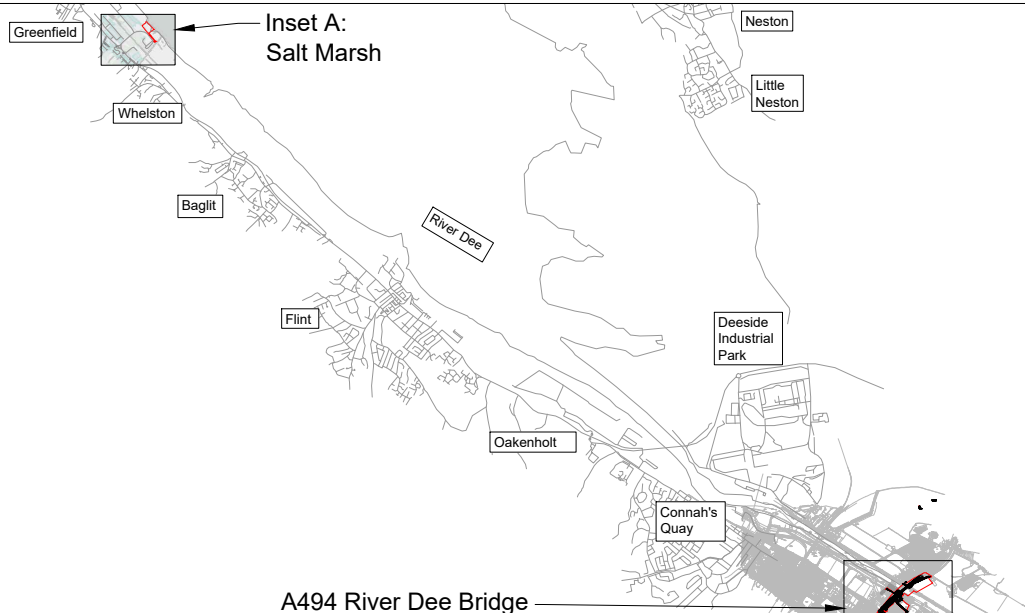
Key to symbols

- Site Boundary
- Land Ownership**
 - Network Rail
 - Flintshire County Council
 - Unregistered
 - Welsh Ministers
 - Private (other)
 - National Resources Wales
- Proposed Scheme Land Acquisition**
 - Permanent Land Take
 - Temporary Construction Land
 - Offsite Environmental Mitigation (temporary land take)
 - Construction Land / Welsh Government Easement for Future Maintenance Access

Reference Drawings

395318-MMD-00-XX-DR-C-0002 Highways General Arrangement

Site Location Plan



P01	11/08/25	EP	Developed Design First Issue	SH	GM
Rev	Date	Drawn	Description	Ch'k'd	App'd

Status Stamp

NOT FOR CONSTRUCTION



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Abergele Road
Colwyn Bay
LL29 8BY
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Client



Title

A494 River Dee Bridge Replacement
Scheme
Developed Design
Proposed Land Acquisition and Usage

Designed	F.SALEH	FS	Eng check	S.HORSFALL	SH
Drawn	E.PROBERT	EP	Coordination	G.MORGAN	GM
Dwg check	S.HORSFALL	SH	Approved	G.MORGAN	GM
MMD Project Number	395318	Scale at A1	1:2500	Security Rstd	
Suitability Description	Suitable for Information				Suit. Code S2
Drawing Number	395318-MMD-00-XX-DR-C-0007				Revision P01

C. Preliminary Outline Construction Programme

ID		Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors	COMMENTS	Half 1, 2021 J M M J S N	Half 2, 2021 J M M J S N	Half 1, 2022 J M M J S N	Half 2, 2022 J M M J S N	Half 1, 2023 J M M J S	Half 2, 2023 J M M J S
1			Key Milestones	1058 days	Fri 20/03/26	Tue 09/04/30									
2			Contract Award (Design Stage)	0 days	Fri 20/03/26	Fri 20/03/26		5FS+7 mons,3	29/5: Due to award Design Stage in March 26.						
3			Detailed Design and Certification	18 mons	Fri 20/03/26	Thu 05/08/27	2	4							
4			Contract Award (Construction Stage)	0 days	Thu 05/08/27	Thu 05/08/27	3	8	29/5: August 27 award for construction stage award after detailed design						
5			WG Instruction to Proceed Diversions	0 days	Thu 01/10/26	Thu 01/10/26	2FS+7 mons	12,13	29/5: After ministers decision letter from Draft Orders (Feb 26) or Public Inquiry complete (Oct 26). Assume Oct 26 for this programme.						
6			Contract Completion	0 days	Tue 09/04/30	Tue 09/04/30	87								
7			Mobilisation and Early Works	410 days	Fri 02/10/26	Thu 27/04/28		23,32							
8			Team Mobilisation	20 days	Fri 06/08/27	Thu 02/09/27	4	9,10							
9			Access to Traveller Site and Main Compound	60 days	Fri 03/09/27	Thu 25/11/27	8		29/5: Constant connection to A494 from Travellers site. Main compound access is direct from A494.						
10			Establish Main Compound and Offices	30 days	Fri 03/09/27	Thu 14/10/27	8	14,16							
11			Key Diversions to enable works (Long lead ins)	360 days	Fri 02/10/26	Thu 17/02/28			29/5: All diversions in Utilities Impact Report						
12			33KV overhead diversions (East side of bridge)	12 mons	Fri 02/10/26	Thu 02/09/27	5	18	29/5: SPEN to complete. Timescale TBC. Approx 12 mons from WG instruction. Needed for bridge work						
13			Rising Main Diversions	18 mons	Fri 02/10/26	Thu 17/02/28	5	15	29/5: Welsh Water to complete. Timescale TBC. Approx 18 mons from WG instruction. Needed for any significant works to proceed						
14			NMU Diversion Routes	30 days	Fri 15/10/27	Thu 25/11/27	10		29/5: Around main compound and travellers site compound, multiple locations to confirm diversions/closures.						
15			Pump Station and Main Diversion from East of Rail Bridge to River Dee	50 days	Fri 18/02/28	Thu 27/04/28	13		29/5: Can only be diverted after rising mains diverted.						
16			Eastern Compound and Satellite Offices	40 days	Fri 15/10/27	Thu 09/12/27	10	17							
17			Western Materials Compound	10 days	Fri 10/12/27	Thu 23/12/27	16								
18			Crane Platform to East	30 days	Fri 03/09/27	Thu 14/10/27	12	20,19	29/5: Relies on 33KV SPEN diversions complete						
19			Temporary Pier to East bank	40 days	Fri 15/10/27	Thu 09/12/27	18	20	29/5: Follows crane platform setup.						
20			Jack-Up Barge Mobilisation	15 days	Fri 10/12/27	Thu 30/12/27	19,18	49	29/5: Follows temporary pier set up.						
21			Stage 1 - New Carriageway and Bridge	381 days	Fri 24/12/27	Fri 08/06/29									
22			Eastern Side (Carriageway)	223 days	Fri 28/04/28	Tue 06/03/29			29/5: Need all mobilisation and early works complete to proceed						
23			Piling Platform Embankment Widening	50 days	Fri 28/04/28	Thu 06/07/28	7	41,24							
24			SU Diversions and Protection	30 days	Fri 07/07/28	Thu 17/08/28	23	25	29/5: IP Gas Main protection						
25			Formation and Sub-Base	5 days	Wed 08/11/28	Tue 14/11/28	45,24	26	29/5: Need bridge abutment in for tie in.						
26			Drainage Works	25 days	Wed 15/11/28	Tue 19/12/28	25	27,28,29							
27			Surfacing and White Lining	15 days	Wed 20/12/28	Tue 09/01/29	26								
28			Safety Barrier	10 days	Wed 20/12/28	Tue 02/01/29	26								
29			Lighting and Signs	40 days	Wed 20/12/28	Tue 13/02/29	26	30FS-5 days,62							
30			Landscaping	20 days	Wed 07/02/29	Tue 06/03/29	29FS-5 days								
31			Western Side (Carriageway)	228 days	Fri 28/04/28	Tue 13/03/29			29/5: Need all mobilisation and early works complete to proceed						
32			Piling Platform and Embankment Widening	50 days	Fri 28/04/28	Thu 06/07/28	7	42,33							
33			SU Diversions and Protection	30 days	Fri 07/07/28	Thu 17/08/28	32	34	29/5: MP Gas main diversion, foul water sewer diversion, BT diversion, HV cable diversion.						
34			Formation and Sub-Base	10 days	Wed 08/11/28	Tue 21/11/28	45,33	35	29/5: Need bridge abutment in for tie in.						
35			Drainage Works	30 days	Wed 22/11/28	Tue 02/01/29	34	36,37,38							
36			Surfacing and White Lining	25 days	Wed 03/01/29	Tue 06/02/29	35								
37			Safety Barrier	15 days	Wed 03/01/29	Tue 23/01/29	35								
38			Lighting and Signs	40 days	Wed 03/01/29	Tue 27/02/29	35	39FS-10 days,62							
39			Landscaping	20 days	Wed 14/02/29	Tue 13/03/29	38FS-10 days								
40			Bridge Replacement	381 days	Fri 24/12/27	Fri 08/06/29									
41			Piling and Pile Cap to East Abutment	30 days	Wed 23/08/28	Tue 03/10/28	23,53	43							
42			Piling and Pile Cap to West Abutment	30 days	Fri 07/07/28	Thu 17/08/28	32	44							
43			East Abutment	15 days	Wed 04/10/28	Tue 24/10/28	41	45,56							
44			West Abutment	15 days	Fri 18/08/28	Thu 07/09/28	42	45,56							
45			Abutment Backfill	10 days	Wed 25/10/28	Tue 07/11/28	43,44	25,34							
46			West Pier Temporary Foot Access Bridge	5 days	Fri 24/12/27	Fri 31/12/27	49SF	47SS							
47			East Pier Temporary Foot Access Bridge	5 days	Mon 25/09/28	Fri 29/09/28	50SF,46SS								
48			In River	168 days	Fri 31/12/27	Tue 22/08/28			29/5: Red7 - Separate programme						
49			Western Pier Piles	45 days	Fri 31/12/27	Thu 02/03/28	20	50,46SF	29/5: Linked to Red7 programme. To updated as required						
50			Eastern Pier Piles (includes platform move)	48 days	Fri 03/03/28	Tue 09/05/28	49	47SF,51	29/5: Linked to Red7 programme. To updated as required						
51			Eastern Pier Pile Cap	30 days	Wed 10/05/28	Tue 20/06/28	50	54,52	29/5: Linked to Red7 programme. To updated as required						

Project: A494 Construction Prog
Date: Fri 30/05/25

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Progress

Manual Progress

Page 1

D. River Piers – Description of Envisaged Construction Methodology

A494 River Dee Bridge Replacement Scheme

Construction, Buildability and Phasing Report (395318-MMD-00-XX-RP-Z-0034)

Appendix D – Description of envisaged methodology for river pier construction

Introduction

This statement outlines the envisaged construction methodology for the river pier works associated with the A494 River Dee Bridge Replacement Scheme. It aims to demonstrate the constructability of the preliminary design and inform the Environmental Impact Assessment (EIA). The methods described are indicative and subject to refinement by the appointed contractor, who will be responsible for assessing environmental impacts and securing all necessary consents.

The construction methodology described is based upon information received and discussions held with specialist piling and jack-up barge contractors.

Site Constraints

Environmental / River Constraints

- The River Dee is designated as a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI), primarily due to its diverse habitats and populations of migratory fish.
- The river is tidal and navigable, requiring careful planning for in-river works.

Access and Infrastructure

- Limited access due to existing infrastructure, utilities, and downstream bridges with headroom restrictions.
- Existing residential and commercial properties adjacent to the bridge on both sides of the A494.

Utilities and Water Assets

- Presence of electricity, water, sewage, gas, and communication services within the scheme area.
- The Queensferry Drain (a designated NRW main river) outfalls within the footprint of the proposed bridge and will require diversion.
- An operational water treatment facility is located adjacent to the scheme and includes an outfall into the river Dee within the proposed bridge footprint, which will also require diversion.

Construction and Consenting

- Flood risk and environmental consenting requirements.
- Need to maintain two lane traffic flow on the A494 in both directions during construction other than for agreed off peak periods.

Alternatives Considered

The following alternative construction methods were evaluated but not progressed due to technical, environmental, or stakeholder concerns:

1. **Temporary River Jetties** – excluded due to anticipated challenges in pile removal and the extensive hydraulic/hydrodynamic modelling required for environmental consenting.
2. **Jack-Up Barge Mobilisation via Airbus Load Out Facility** – excluded due to sedimentation at the site, uncertain structural condition post-desiltation, silt management complexities, and stakeholder objections.
3. **Temporary Dredged Pockets at Bridge Site** – excluded due to the depth of dredging required, associated silt movement risks, and environmental consenting challenges.

Assumed Construction Methodology

The following outlines the anticipated construction methodology for the river-based works, subject to refinement during detailed design and stakeholder consultation.

General Assumptions

It is assumed that the works will be undertaken using a 400t jack-up barge equipped with a 160t crawler crane and a 120t piling drill rig. The jack-up barge will be supported by additional marine craft, including flattop vessels for material transport/storage and low-draft multi-cats for vessel maneuvering.

All in-river works will be subject to a Marine Licence application to Natural Resources Wales (NRW).

Stage 1 – Mobilisation of Marine Vessels

Mobilisation of the jack-up barge will be partially completed offsite (e.g., at a dry dock on the River Mersey) due to headroom and tidal depth constraints under the downstream approach bridges. Final assembly, including attachment of jack-up legs, will occur at the project site.

Navigation to the site will require careful planning to mitigate risks such as sandbanks, tidal conditions, and bridge clearances. Stakeholder consultation will be required with:

- Natural Resources Wales (NRW)

- Dee Conservancy Harbourmaster
- Network Rail (Hawarden Bridge)
- Flintshire Council (B5441 Bascule Bridge)
- NMWTRA (A494 River Dee Bridge)

Stage 2 – Crane Platform and Temporary Moorings

A crane pad will be constructed on the eastern riverbank to accommodate a 360t crawler crane for final barge assembly / disassembly and equipment transfer.

The works may require diversion of existing utilities, including 33kV power lines, and will need to consider impacts on the River Dee flood bund. A Flood Risk Activity Permit (FRAP) will need to be sought from NRW.

Temporary moorings will be installed to secure the jack-up barge during operations.

Stage 3 – Temporary Jetty Construction

A temporary jetty will be constructed adjacent to the bridge site to facilitate transfer of the 160t crawler crane and piling rig onto the jack-up barge.

The jetty will also serve as a working platform during piling operations.

Utility diversions and flood bund impacts will be considered, and any support piles projecting into the river channel will require NRW consent.

Stage 4 – Drilling Fluid Batching and Recycling Plant Construction

A concrete base measuring approximately 15m x 20m with 250mm high containment edges will be constructed on the eastern bank of the river. A drilling fluid batching and recycling plant will be installed on this base.

Stage 5 – Pile Installation

The jack-up barge will be positioned and stabilised using its legs.

A flattop support barge will deliver materials including steel casings and reinforcement cages.

The 160t crane will install steel casings into the riverbed to a depth of approximately 13m into glacial till. Casings will be oscillated or driven in using vibration methods.

Once the casings are in place, the piling rig will drill within them to a depth of approximately 34m. Excavated spoil will be collected in skips and transferred to land for disposal via the support barge.

During drilling, bentonite or polymer-based drilling fluid will be pumped from the landside batching plant into the borehole to support the excavation.

Steel reinforcement cages will be spliced and lowered into the drilled hole using the 160t crane.

Concrete will be placed via a tremie (watertight) pipe, displacing the drilling fluid, which will be pumped back to the landside batching plant for recycling. Concrete will be supplied from a mobile pump on the riverbank and conveyed via a pipe system supported by pontoons or with a large mobile pump.

An overpour of approximately 1m above the cut-off level is expected to ensure structural integrity.

The jack-up barge will then relocate and repeat the process for all 24 piles.

Stage 6 – Pile Cap Installation

Using the jack-up barge as an access platform, temporary formwork or precast caissons will be installed around the piles. Piles will be broken down as required and reinforcement will be fixed, and concrete pumped to form continuous pile caps and piers.

This process will be repeated for both river piers.

Stage 7 – Demobilisation of all plant and equipment

Demobilisation will follow the reverse sequence of Stages 1–3. Temporary platforms will be dismantled, and the site reinstated.

E. Existing Bridge Demolition - Construction Statement

A494 River Dee Bridge Replacement Scheme

Construction, Buildability and Phasing Report (395318-MMD-00-XX-RP-Z-0034)

Appendix E – Description of envisaged methodology for demolition of the existing bridge structure

Introduction

This statement discusses the envisaged construction methodology for the demolition of the existing A494 River Dee bridge structure. It has been drafted to demonstrate the constructability of the preliminary design and inform the Environmental Impact Assessment (EIA). The methods described are indicative and subject to refinement by the appointed contractor, who will be responsible for assessing environmental impacts and securing all necessary consents.

Site Constraints

Environmental / River Constraints

- The River Dee is designated as a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI), primarily due to its diverse habitats and populations of migratory fish.
- The river is tidal and navigable, requiring careful planning for in-river works.

Access and Infrastructure

- Limited access due to existing infrastructure, utilities (including 11kV overhead electricity line immediately downstream of the bridge), and downstream bridges with headroom restrictions.
- Existing residential and commercial properties adjacent to the bridge on both sides of the A494.
- Presence of electricity, water, sewage, gas, and communication services within the scheme area.

Construction and Consenting

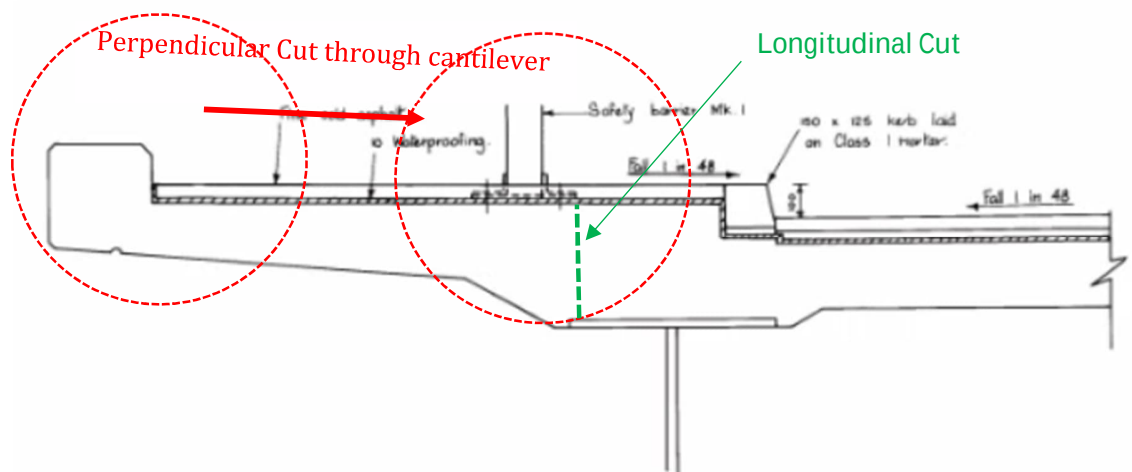
- Flood risk and environmental consenting requirements.
- Need to maintain two lane traffic flow on the A494 in both directions during construction other than for agreed off peak periods.

1. , associated silt movement risks, and environmental consenting challenges.

Assumed Construction Methodology

Superstructure Removal Sequence

1. Plane off surface and remove all PCC kerbs.
2. Install crash deck / access platform to bottom flanges of beams – this will progress at same time as parapet removal. It will not be possible to board out within the central spans due to the presence of the rising mains and limited space.
3. Parapet stringcourse removal:
 - i. Remove vehicular barrier in verge and central reserve, if feasible plane or break out the mass fill concrete infill to the verge.
 - ii. Remove steel parapet railings (leaving posts) installing temporary pedestrian guardrail to posts and vehicular stop blocks along kerblines
 - iii. Circular saw cantilever perpendicular to span to spacing that suits lifting out with a small crane on the deck up to main beam top flange (see detail below). Core two holes through cantilevers at centre of gravity to allow lifting eyes to be fitted.

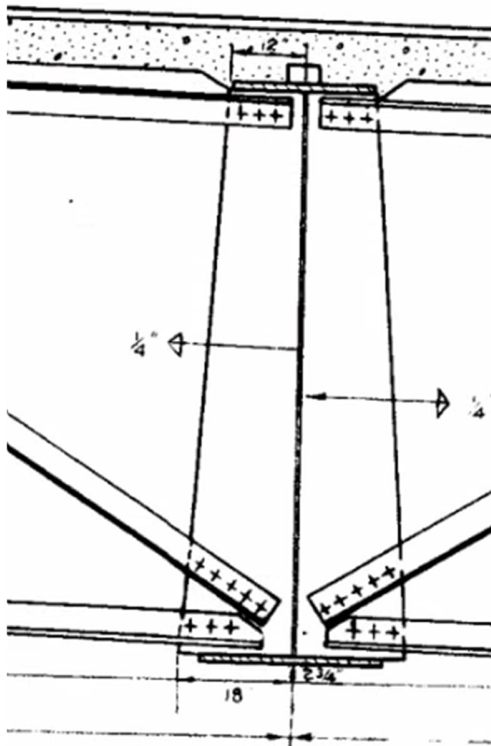


- iv. In parallel with the adjacent stringcourse removal remove the central PC slabs and saw cut the cantilevers in a similar way to the parapet cantilevers
- v. Support section on crane and saw cut longitudinally along outside line of main beam top flange to release unit. Lift out and repeat operation along the bridge. Pedestrian guardrail and stop blocks to be installed to protect edge as works progress.

4. Bridge Deck Removal - Note, all steelwork bracing is to remain in place. For both options presented the central span concrete and rising mains will be removed up to the half joints first prior to undertaking the same operation on the side spans.

Option 1 – Lift out sections – structural assessments will be required for different stages and crane loadings

- Progressively saw cut longitudinally at a 50mm offset to the edge of the top flanges to retain 50mm bearing on the flange for the length of panel to be removed starting at the central span between expansion joints.
- Attach lifting points or core through for attachment of lifting eyes
- Attach crane and saw cut laterally to remove each deck section and lift out the section. Repeat operation until all sections are removed
- This will leave the steel beams with a section of slab in place where there are shear studs / plates. Note, Shear studs / plates are not detailed on the as-built drawings which is unusual but maybe shown indicatively on the image below. If these are not present then a single longitudinal cut will be needed along the centreline of each beam instead of two.



Option 2 – Break out the deck

- Starting from the centre progressively break out the bridge deck using concrete shears and breakers allowing debris to collect on the crash deck below.

- As works progress clear debris from the crash deck as loading of these will be limited.
5. Remove the bridge steelwork using a crane situated on the eastern bank first to remove the central sections and the eastern side spans. Move the crane to the western side and remove the western steelwork side spans.

Note. The slewing of the crane needs to allow the lifted load to pass through the corridor shown below to avoid lifting over live traffic and the 11KV cable that spans across the River Dee to the north.



6. Break out the abutment ballast walls and cover the existing abutments with fill material and topsoil (assumes that abutment will remain in place).

Bridge Pier Removal

The following details the access and options considered to remove the existing piers and piles. While initial assessments have considered various removal methods, the decision has been made to retain the piers and piles within the river due to the significant risks and high costs associated with their removal. Ongoing studies are evaluating the need for any remedial works and exploring opportunities to improve the visual integration of these structures, as well as their potential to support ecological enhancements.

Access

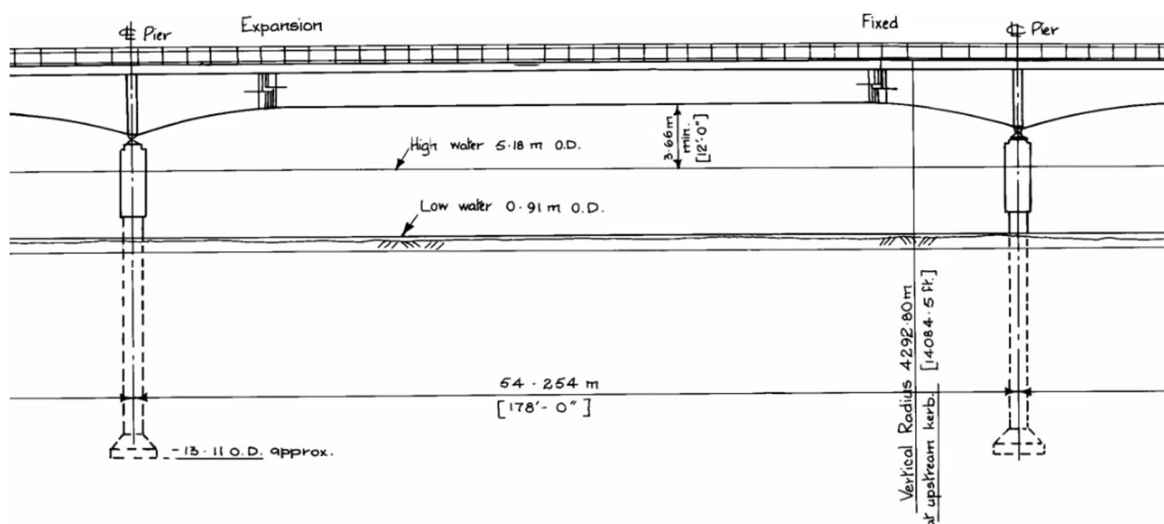
A stable platform and support vessels within the river will be needed to enable plant and equipment to work safely.

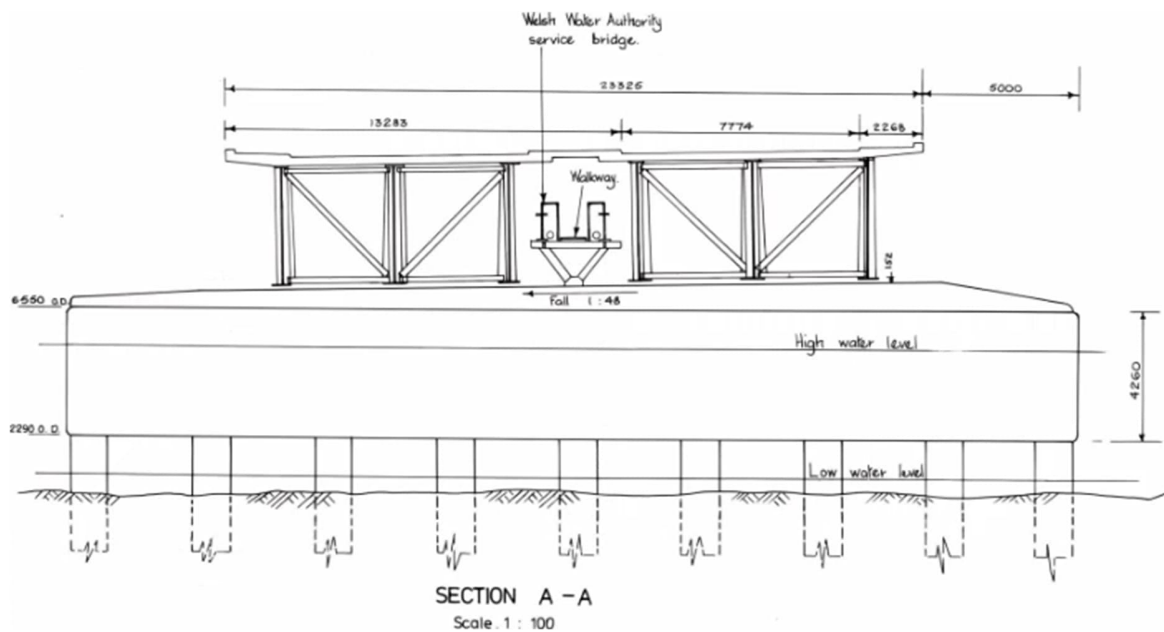
Option 1

1. Mobilise jack up barge at eastern pier, the barge will carry a small excavator and a diamond wire cutting machine. A large crane will be situated behind the existing abutment.
2. Locate the barge next to the eastern pier within the main channel.
3. Wire cut the RC pier between each pile vertically to separate the pier sections onto a single pile (8 No cuts)
4. Attach lifting points to each section and support on the crane and cut the pile 1.0m below bed level – This is the part of the operation that is very hazardous and risky and is covered within the following section. Once the pile is cut through the section of pile and pile cap can be lifted onto land for disposal.

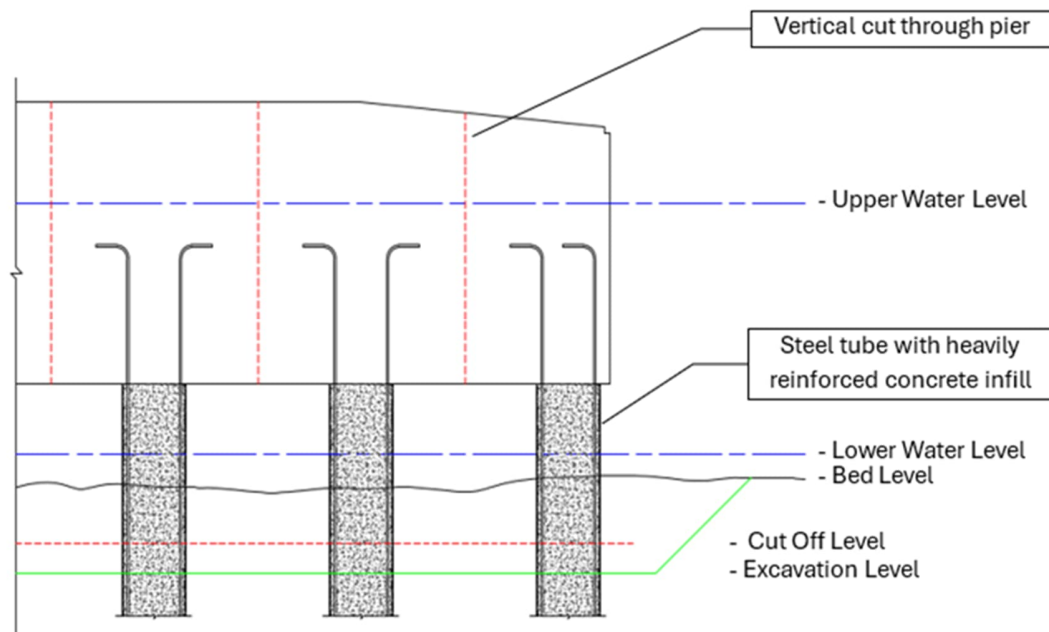
Risks and Hazards Associated with Pier and Pile Removal

The extracts from the as-built records below shows the range of water levels relative to the piers and piles within the river.





The sketch below shows the vertical cut required through the pier such that each section is supported on a single pile. The piles are 1200mm diameter and reinforced heavily with 40mm diameter reinforcing bars and infilled with concrete which are connected into the pier reinforced concrete.



The pile cut off level is 1000mm below bed level and a trench to gain access to this area will need to be 500mm below the pile cut off level (shown by the green line). The 15mm thick steel casing will need to be removed from around the pile for a length of 200mm.

The Reinforced concrete will need to be cut through this area to allow the section of pier and pile to be lifted out of the river.

At this stage the only method found that could undertake these operations is abrasive underwater jetting which has not been confirmed by a specialist sub-contractor. Assuming this can be undertaken by divers with cutting tools and plant / equipment within the water the following risks have been identified:

- i. The excavation can fill with debris from the river bed as it is washed down the channel causing harm to divers within the water
- ii. Low visibility to safely operate the equipment
- iii. Debris falling from or above the work area trapping hands / limbs
- iv. Divers washed out of excavation due to tidal currents
- v. The excavation is likely to partially or fully fill during each tide which will require the area to be excavated prior to the operation commencing each day.

Under the CDM Regulations 2015 this activity is likely to be assessed as a Schedule 3 CDM risk (Work which puts workers at risk of burial under earthfalls, engulfment in swampland or falling from a height, where the risk is particularly aggravated by the nature of the work or processes used or by the environment at the place of work or site).

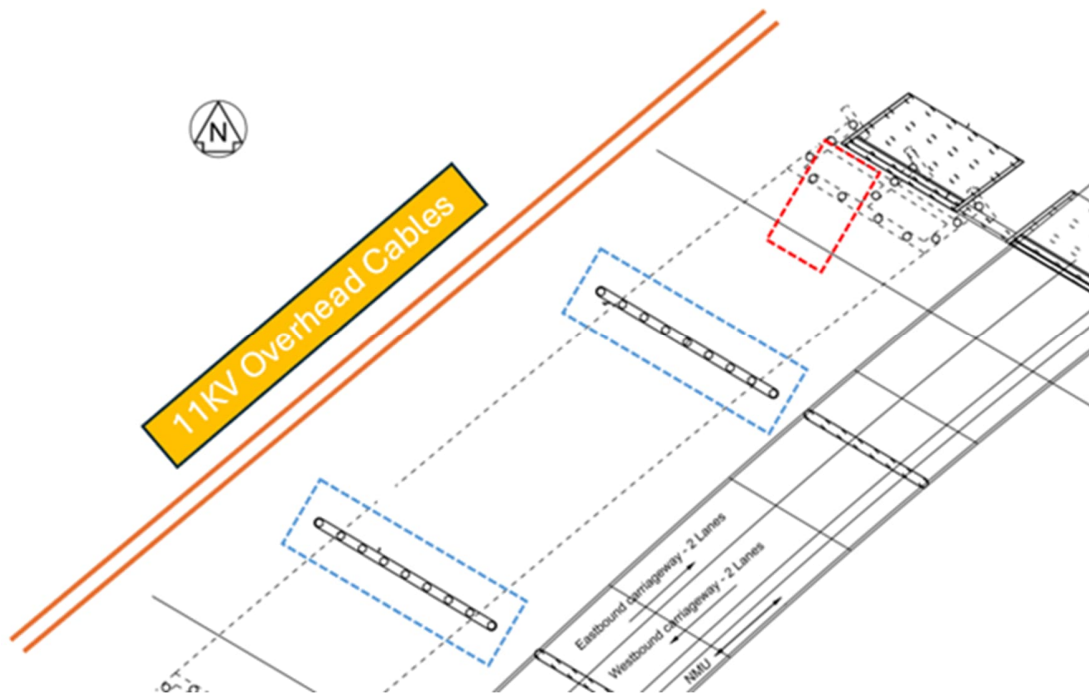
Option 2 - Cofferdam Provision

The only option identified at this stage that minimises hazards and risk to remove the pier and piles would be to install a sheet piled cofferdam around the full perimeter of each pier to provide a safe working space and remove the need for divers.

Methodology

The cofferdams are shown in the image below. The sheet piles would need to be hydraulically pushed or vibrated into position which can't be undertaken from the riverbank. A jack up barge would be required to allow plant and materials to be moved to the cofferdam location and install / remove the cofferdams. To facilitate this a small jetty to the north of the new bridge would be required to enable the piling equipment to be transferred onto the barge.

Small excavators with breaking equipment would be lifted from the back of the existing abutments with a large crane into the cofferdam to allow the piers to be broken out and the piles cut down to a level around 1.0m below bed level. An excavator located on the jack up barge would be used to remove material from within the cofferdam.



11KV cables

The 11KV cables are in close proximity to the northern end of each pier and pose a risk to the installation of sheet piles adjacent to them. As a minimum precautionary measure the power supply would need to be isolated during the installation and removal of the sheet piles. If this is not acceptable to the power company then a diversion maybe insisted upon.

Programme

The works to demolish the piers are expected to take 4-6 months to complete, during this period the NMU route along the eastern riverbank will need to remain closed.

